

required by the claim. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990)(emphasis added).

Kodera does not teach a means for advancing packaging material continuously and **sequentially from** a means for applying a hydrogen peroxide solution to a surface of a packaging material **through** a means for directing a stream of air on the surface of said packaging material to remove substantially all but a residual or trace quantity of hydrogen peroxide **and then to** a means for irradiating said packaging material with UV light having a UV wavelength between 200nm and 320nm.

The Office has asserted that the parts of the apparatus taught by Kodera “are capable of being connected in sequence.” However, the parts of the Kodera apparatus are not in fact taught or suggested as being connected in the sequence required by the present claims and there is no teaching or suggestion of any means to transport packing material sequentially in the order required by the present claims. That the parts of a prior art apparatus are merely capable of being rearranged in the sequence required for the presently claimed invention does not meet the standard required for anticipation.

To be anticipatory, the elements of a prior art reference must be arranged as required by the claim. *Id.* Kodera does not teach or suggest the arrangement required by the present claims. Therefore, Kodera does not anticipate the present claims. Accordingly, withdrawal of the rejection is respectfully requested.

2. **Rejections under 35 U.S.C. § 103**

A. Kodera and Castberg

Claims 18, 27 and 32 stand rejected under 35 U.S.C. § 103 as allegedly unpatentable over Kodera and further in view of Castberg et al., U.S. Patent No. 5,744,094 ("Castberg"). The rejection is respectfully traversed.

Castberg is cited for disclosing an eximer lamp. However, the combination of Castberg and Kodera fail to support a prima facie case of obviousness. To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. M.P.E.P. § 2143.

Kodera is discussed above. Like Kodera, Castberg does not teach or even suggest arranging the elements of Kodera in the sequence required by the present claims. And like Kodera, Castberg does not teach or suggest a means for advancing packaging material continuously and **sequentially from** a means for applying a hydrogen peroxide solution to a surface of a packaging material **through** a means for directing a stream of air on the surface of said packaging material to remove substantially all but a residual or trace quantity of hydrogen peroxide **and then to** a means for irradiating said packaging material with UV light having a UV wavelength between 200nm and 320nm.

Therefore, Castberg does not cure the deficiencies in Kodera and the combination of Kodera and Castberg fails to support a prima facie case of obviousness. Accordingly, withdrawal of the rejection is respectfully requested.

B. Doucette, Koderer, DiGeronimo and Loliger and Lagunas-Solare

Claims 4 and 28 stand rejected under 35 U.S.C. § 103 as allegedly unpatentable over Doucette et al., U.S. Patent No. 4,366,125 ("Doucette") in view of Koderer, DiGeronimo, U.S. Patent No. 4,494,357 ("DiGeronimo") and further in view of Loliger et al., U. S. Patent No. 3,692,468 ("Loliger."). Claims 2-3, 5 and 21-25 stand rejected under 35 U.S.C. § 103 as allegedly unpatentable over Doucette in view of Koderer, and further in view of DiGeronimo. Claim 6 stands rejected under 35 U.S.C. § 103 as allegedly unpatentable over Doucette in view of Koderer, DiGeronimo and further in view of Lagunas-Solare et al., U. S. Patent No. 5,364,645 ("Lagunas-Solare"). Only Doucette is newly cited in the present Office Action. The deficiencies of Koderer are discussed above. DiGeronimo and Loliger and Lagunas-Solare are cited for specific teachings that are alleged to be combinable with Doucette and Koderer, and are addressed below. These rejections are respectfully traversed.

The process disclosed by Doucette is very different from the method carried out by the presently claimed apparatus. Doucette discloses a sterilizing chamber (C) in the shape of a rectangular box enclosing baths (63,73) containing germicidal liquid, a series of rollers (53, 59, 67, 69, 77, 81) for guiding a web (W) along a predetermined path through the chamber (C) and UV lamps (85,91). The process steps of Doucette are carried out in a single chamber having a sponge (51) soaked in germicidal liquid, first and second baths(63, 73) containing germicidal liquid, three UV lamps (85, 87, 91) and heater plates (91). The web (W) is wetted with the sponge soaked in germicidal liquid. A first UV irradiation of the wetted web with the first UV lamp (85) is carried out. The web is then immersed in the first bath (63) of germicidal liquid. A second UV irradiation of the wet web with the second UV lamp (87) is carried out. The web is then immersed in the second bath (73) of germicidal liquid. A third UV irradiation of the wet web with the third UV lamp (91) is carried out. Then the web is

dried with heater plates (89), a fourth UV irradiation of the wet web with the same third UV lamp (91) is carried out.

The Office acknowledges that Doucette fails to teach the use of liquid hydrogen peroxide, the use of air for retaining a residual quantity of hydrogen peroxide absorbed by or adjacent to microorganisms present on the surface of the sheet material, a UV wavelength of about 200 nm and 320 nm, a temperature of the liquid hydrogen peroxide and contact time from 0.5 seconds to 2 seconds. The Office has alleged that it would have been obvious to use the hydrogen peroxide solution of Koderia to immerse web material for one second and to substitute heater plates with hot air. However, the modifications to Doucette that would be required to arrive at the present invention are so extensive and contrary to the approach taught by Doucette that a person of ordinary skill in the art would have had no motivation to make the modifications without express guidance, but the prior art does not even imply a suggestion to make such extensive modifications.

If one were to attempt to modify Doucette to function in a manner capable of carrying out the presently claimed method, one would have to eliminate the sponge (51) applying germicidal liquid onto the web (W), eliminate the UV lamp (85) located downstream of the sponge (51) for carrying out the first UV irradiation of the web with germicidal liquid applied thereon, eliminate the first bath of germicidal liquid, eliminate the second UV lamp located downstream of the bath, and modify the structure of the chamber so that the third UV lamp does not irradiate the web with germicidal liquid applied thereon at the exit of the bath, but remains available only to irradiate the web downstream of the heater plates.

In effect, the second bath, drying plates and third UV lamp would have to be taken entirely out of the context of the teaching of Doucette as a whole, before even beginning to

combine Doucette with the cited secondary references as the Office proposes. There is no suggestion anywhere in the prior art that would lead the ordinary practitioner to do this.

Furthermore, contrary to the allegation of the Office, it would not have been obvious to substitute a means for directing a stream of air on the surface of said packaging material to remove substantially all but a residual trace quantity of hydrogen peroxide connected in sequence of a means for irradiating packaging material for the heating plates of Doucette that are located downstream of the of a sponge, two baths, and three UV lamps. The use of a stream of air as proposed by the Office is incompatible with the teaching of Doucette. Doucette teaches applying germicidal liquid three times and irradiating the web three times while the web is wetted with germicidal liquid before drying the web using heaters. There is simply no teaching or suggestion in any of the cited references separately or in combination that would lead one of skill in the art to the method of the present invention or the arrangement of elements of the claimed apparatus in the sequence required by the claims.

It is impermissible to first ascertain factually what applicants did and then view the prior art in such a manner as to select from the random facts of that art only those which may be modified and then utilized to reconstruct applicant's invention from such prior art. *See, e.g., Interconnect Planning Corp. v. Feil*, 227 U.S.P.Q. 543, 550 (Fed. Cir. 1985); *see also, In re Shuman*, 150 U.S.P.Q. 54, 57 (C.C.P.A 1966). In asserting this rejection, the Office has taken a primary reference that unequivocally directed to a very distinct approach, and using impermissible hindsight, selectively picked secondary references that are purported to teach one individual modification or another in an attempt to reconstruct the presently claimed invention.

An analysis of obviousness of a claimed combination must include consideration of the results achieved by that combination. *The Gillette Co. v. S.C. Johnson & Son Inc.*, 16

USPQ2d 1923, 1928 (Fed. Cir. 1990). Critical to the analysis is an understanding of the particular results achieved by the new combination. *Id.* (citing *Interconnect Planning Corporation v. Feil*, 227 U.S.P.Q. 543, 551 (Fed. Cir 1985)).

The surprising and unobvious results achievable by the presently claimed sequence of steps and apparatus for carrying them out have been demonstrated by Reidmiller et al., *Journal of Food Protection*, 66(7):1233-40, 2003 (attached to the Amendment and Reply filed August 19, 2005 as Annex 2). Prior to the present invention, it was not appreciated in the art that synergistic sterilization could occur if substantially all but a trace quantity of hydrogen peroxide is removed prior to UV irradiation. Hence, the teaching of Kodera and Doucette that a web should be irradiated while wet, which was the conventional view in the prior art.

Contrary to common expectations in the art prior to the present invention, at page 1238, Reidmiller et al. reports that "Even if there is drying between peroxide exposure and UV radiation, synergistic killing can occur." Panels B, C, and D of Figure 6 on page 1238 demonstrate the surprising fact that synergistic killing can occur even after peroxide is substantially removed by drying. The concluding remarks on page 1239 state that the new findings, that killing of hydrogen peroxide exposed spores by UV light is just as effective after drying "should lead to a more effective use of peroxide-UV light regimens for sterilization. Certainly they will allow more freedom in machine design." Indeed, even in 2003 the effectiveness of the sequence of steps recited in the present claims was considered surprising by persons of skill in the art.

The additional references do not cure the defects of Doucette and Kodera. DiGeronimo is cited for allegedly teaching irradiating at 254 nm. Loliger is cited for allegedly teaching a peroxide bath temperature of 60 °C. Lagunas-Solare is cited for

allegedly teaching the use of polychromatic light. DiGeronomo, Loliger and Lagunas-Solare, even when combined, fail to remedy the deficiencies of Doucette and Kodera.

The cited prior art fails to support a prima facie case of obviousness, because there is no teaching or suggestion that would lead a person of ordinary skill to modify the prior art as the Office has proposed. In fact, it was surprising to the those of skill in the art that the methods and apparatus of the invention could work as effectively as has been demonstrated. For at least the foregoing reasons, withdrawal of the rejection is respectfully requested.

CONCLUSION

In view of the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order. Such action is earnestly solicited.

In the event that there are any questions relating to this application, it would be appreciated if the Examiner would telephone the undersigned concerning such questions so that prosecution of this application may be expedited.

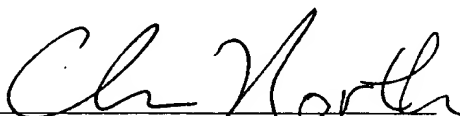
The Director is hereby authorized to charge any appropriate fees that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

Respectfully submitted,

BUCHANAN INGERSOLL PC

Date: June 30, 2006

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